

### Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the above-identified application:

1. (Withdrawn - currently amended) [[A]] An isolated nucleic acid molecule comprising a polynucleotide fragment having a nucleotide sequence that encodes at least a C-terminal portion of an i-antigen polypeptide having amino acid sequence SEQ ID NO:6.
2. (Withdrawn - currently amended) The nucleic acid molecule of claim [[2]] 1 comprising SEQ ID NO:1.
3. (Currently amended) [[A]] An isolated nucleic acid molecule comprising a polynucleotide fragment having a nucleotide sequence that encodes an antigenic portion of an i-antigen polypeptide having amino acid sequence SEQ ID NO:7, said antigenic portion of the i-antigen polypeptide comprising at least about 60 amino acids and being capable of inducing an immune response in a fish against *I. multifiliis*.
4. (Currently amended) [[A]] An isolated nucleic acid molecule comprising a polynucleotide fragment having a nucleotide sequence that encodes at least one terminal membrane targeting portion of an i-antigen polypeptide having amino acid sequence SEQ ID NO:7, said terminal membrane targeting portion comprising at least about 10 amino acids and being capable of targeting a polypeptide to either the endoplasmic reticulum or to the plasma membrane.
5. (Currently amended) [[A]] An isolated nucleic acid molecule comprising a polynucleotide fragment having a nucleic acid sequence that encodes SEQ ID NO:7.

6. (Currently amended) The nucleic acid molecule of any of claims 3-5 or 36 that is a vector capable of expressing the polypeptide encoded by the nucleic acid sequence in a Tetrahymena host cell ~~selected from the group consisting of a bacterium, a protozoan, a yeast, an insect cell, and an animal cell.~~
7. - 9. (Canceled)
10. (Currently amended) [[A]] An isolated nucleic acid molecule that is substantially complementary to hybridizes with any of the nucleic acid molecules of claims 3-5 or 36 under conditions exemplified by about 150 mM NaCl, 15 mM trisodium citrate, and pH 7.6 at 55°C.
11. (Currently amended) [[A]] An isolated nucleic acid molecule comprising a polynucleotide fragment that hybridizes to at least a portion of the complement of SEQ ID NO:3, SEQ ID NO:5, SEQ ID NO:44 or SEQ ID NO:102 under standard hybridization conditions comprising about 150 mM NaCl, 15 mM trisodium citrate, and pH 7.6 at 55°C, wherein the polynucleotide fragment encodes a polypeptide comprising at least a membrane targeting portion or an antigenic portion of an i-antigen protein, wherein said antigenic portion is capable of inducing an immune response in a fish.
12. (Withdrawn - currently amended) A polypeptide selected from the group consisting of:
- an i-antigen polypeptide having SEQ ID NO:6;
  - an i-antigen polypeptide having SEQ ID NO:7;
  - an analog or modification of an i-antigen polypeptide having SEQ ID NO:6;
  - a fragment of an i-antigen polypeptide having SEQ ID NO:6 wherein the fragment comprises at least a C-terminal portion of SEQ ID NO:6;
  - an analog or modification of an i-antigen polypeptide having SEQ ID NO:7;

a fragment of an i-antigen polypeptide having SEQ ID NO:7 wherein the fragment comprises at least ~~at least~~ one terminal portion of SEQ ID NO:7; and  
an antigenic fragment of an i-antigen polypeptide having SEQ ID NO:7; and  
an i-antigen polypeptide that shares a significant level of primary structure with at least one of SEQ ID NO:6 and SEQ ID NO:7.

13. (Withdrawn) The polypeptide of claim 12 that is antigenic.
14. (Currently amended) A composition for inducing an immune response in a fish, said composition comprising at least one nucleic acid molecule of any of claims [[3-7]]3-6, 10, 11 or 36.
15. (Withdrawn) The composition of claim 14 comprising a polypeptide of claim 13.
16. (Canceled)
17. (Original) The composition of claim 14 wherein administration of the composition to fish prevents or controls *I. multifiliis* infection.
18. (Previously presented) The composition of claim 14 wherein the nucleotide sequence encodes an antigenic portion of an i-antigen polypeptide linked at its carboxy-terminus to a plurality of molecules of the C3d component of complement.
19. (Original) The composition of claim 14 formulated for oral administration.
20. (Original) The composition of claim 19 wherein the polypeptide or nucleic acid molecule is encapsulated in a biodegradable polymer.

21. (Currently amended) A *Tetrahymena* host cell transformed with the nucleic acid molecule of claim 6.
22. (Withdrawn) A fish comprising the nucleic acid molecule of any of claims 1, 3 or 4.
23. (Currently amended) Transformed *Tetrahymena* comprising the nucleic acid molecule of any of claims [[3-11]] 3-6, 10, 11 or 36.
24. (Withdrawn) An antibody capable of binding a polypeptide of claim 12.
25. (Withdrawn) A method for detecting *Ichthyophthirius* in an aquaculture comprising:  
obtaining a sample containing nucleic acid from an aquaculture fish or an aquaculture water;  
adding at least one primer oligonucleotide having a sequence complementary to at least a portion of SEQ ID NO:1 or SEQ ID NO:3 to the nucleic acid sample;  
conducting a polymerase chain reaction amplification with the sample;  
and analyzing the reaction mixture for the presence of a product amplified by the at least one oligonucleotide primer.
26. (Withdrawn - currently amended) The method of claim 25 wherein the primer is capable of amplifying nucleotide sequences encoding i-antigens derived from at least two different *I. multifiliis* serotypes.
27. (Withdrawn) The method of claim 26 wherein the primer has a nucleic acid sequence that encodes an amino acid sequence selected from the group consisting of MKYNILLT (SEQ ID NO:36), FLSISLLF (SEQ ID NO:38), GTALDDGV (SEQ ID NO:46), AGTDTCT (SEQ ID NO:48), CTKKLTSGA (SEQ ID NO:50) and FAKFLSISL (SEQ ID NO:52).

28. (Withdrawn - currently amended) The method of claim 25 further comprising making [[an]] a polynucleotide vaccine comprising at least a portion of the amplified product, wherein the portion of the amplified product encodes an antigenic polypeptide.
29. (Withdrawn) The method of claim 25 further comprising making a protein subunit vaccine comprising an antigenic polypeptide encoded by at least a portion of the amplified product.
30. (Withdrawn) The method of claims 28 or 29 further comprising administering the vaccine to fish to treat or prevent *Ichthyophthirius* infection.
31. (Withdrawn) A method for identifying an *I. multifiliis* serotype comprising:  
providing a sample comprising an *I. multifiliis* nucleic acid molecule having a nucleotide sequence encoding an i-antigen;  
adding to the sample at least one primer oligonucleotide having a sequence complementary to a unique region of an *I. multifiliis* nucleotide sequence encoding an i-antigen;  
subjecting the sample to amplification conditions; and  
analyzing the sample to determine the presence of a product amplified by the at least one oligonucleotide primer.
32. (Withdrawn) A method for inducing an immune response in a fish comprising administering to the fish the immunogenic composition of claim 14.
33. (Withdrawn) The method of claim 32 performed prophylactically in advance of exposure to *I. multifiliis*.

**Amendment and Response**

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34. (Withdrawn) The method of claim 32 performed therapeutically while the fish is infected with *I. multifiliis*.
35. (Withdrawn) The method of claim 32 wherein administration is performed by injection, immersion, or oral ingestion.
36. (Previously presented) The nucleic acid molecule of claim 5 comprising at least one nucleotide sequence selected from the group consisting of SEQ ID NO:3, SEQ ID NO:5, SEQ ID NO:44 and SEQ ID NO:102.
37. (Canceled)